

34 portion for movement between a first position, with said
35 second fuel valve spaced from engagement with said second
36 fuel valve seat for permitting flow of fuel within said fuel
37 conduit within said second body portion, and a second
38 position, with said second fuel valve in engagement with
39 said second fuel valve seat for restricting flow of fuel
40 through said fuel conduit within said second body portion,

41 a securement element securing together said
42 first body portion and said second body portion in said
43 first condition, said securement element adapted to release
44 engagement of said first body portion and said second body
45 portion upon application of tension force to the hose,
46 across said breakaway assembly, above a predetermined
47 maximum level,

48 a first spring urging said first fuel valve toward
49 said second position and a second spring urging said second
50 fuel valve toward said second position, and, in said first
51 condition of said breakaway assembly, said first fuel valve
52 and said second fuel valve being urged toward said first
53 positions,

54 whereby, during normal operation, the first and
55 second body portions are secured together by the securement
56 element, and the first and second fuel valves are urged
57 toward their first (open) positions, and, upon application
58 to the hose of tension above a predetermined maximum level,
59 the securement element releases, allowing the first and
60 second body portions to separate, and allowing the first and
61 second fuel valves to move toward their second (closed)
62 positions to cease flow of fuel from both body portions.

1 2. The breakaway assembly of claim 1 wherein said
2 securement element comprises a shear member, said shear
3 member, in the first condition of said breakaway assembly,

4 adapted to ~~secure together~~ said first and second body
5 portions, and, upon application of tension force above said
6 predetermined level, said shear member being adapted to
7 shear to allow said first and second body portions to
8 separate and the breakaway assembly to assume the second
9 condition.

1 3. The breakaway assembly of claim 1 wherein said
2 first fuel valve and said second fuel valve are mounted for
3 axial movement.

1 4. The breakaway assembly of claim 1 wherein, in
2 said first condition, said first fuel valve and said second
3 fuel valve are disposed in engagement in a manner to
4 mutually urge said first fuel valve and said second fuel
5 valve toward said respective first (open) positions.

1 5. The breakaway assembly of claim 1 wherein the
2 hose defines the first, fuel conduit for delivery of fuel
3 from the dispenser unit to the nozzle and further defines a
4 second, vapor conduit for vacuum flow of vapor displaced
5 from the vehicle tank, and
6 said first body portion and said second body portion
7 together define a vapor conduit connecting the vapor conduit
8 of the first hose segment with the vapor conduit of the
9 second hose segment for vacuum flow of vapor through the
10 breakaway assembly,
11 said breakaway assembly further comprising:
12 a vapor valve and a vapor valve seat, said
13 vapor valve mounted in said first body portion for movement
14 between a first position, with said vapor valve spaced from
15 engagement with said vapor valve seat for permitting vacuum
16 flow of vapor within said vapor conduit within said first

17 body portion, and a second position, with said vapor valve
18 in engagement with said vapor valve seat for restricting
19 vacuum flow through said vapor conduit within said first
20 body portion,

21 a vapor valve spring urging said vapor valve toward
22 said second position and, in said first condition of said
23 breakaway assembly, said vapor valve being urged toward said
24 first position,

25 whereby, during normal operation, the vapor valve is
26 urged toward its first (open) position, and, upon
27 application to the hose of tension above a predetermined
28 maximum level, the securement element releases, allowing the
29 first and second body portions to separate, and allowing the
30 vapor valve to move toward its second (closed) position to
31 cease vacuum flow through the first body portion.

1 6. The breakaway assembly of claim 5 wherein the
2 hose is coaxial, and the first conduit for delivery of fuel
3 is a first, outer conduit and the second conduit for vacuum
4 flow of vapor displaced from the vehicle tank is a second,
5 inner conduit.

a 1 7. The breakaway assembly of claim 5 wherein said
2 vapor valve is mounted for axial movement.

1 8. The breakaway assembly of claim 7 wherein, in
2 said first condition, said vapor valve and said second fuel
3 valve are disposed in engagement in a manner to mutually
4 urge said vapor valve and second fuel valve toward said
5 respective first (open) positions.

9. A fuel dispenser assembly comprising:

claim 7

4 1
1 10. The fuel dispenser assembly of claim 9 wherein
2 said securement element comprises a shear member, said shear
3 member, in the first condition of said breakaway assembly,
4 adapted to secure together said first and second body
5 portions, and, upon application of tension force above said
6 predetermined level, said shear member being adapted to
7 shear to allow said first and second body portions to
8 separate and the breakaway assembly to assume the second
9 condition.

9 1
1 11. The fuel dispenser assembly of claim 9 wherein
2 said first fuel valve and said second fuel valve are mounted
3 for axial movement.

10 1
1 12. The fuel dispenser assembly of claim 9 wherein,
2 in said first condition, said first fuel valve and said
3 second fuel valve are disposed in engagement in a manner to
4 mutually urge said first fuel valve and said second fuel
5 valve toward said respective first (open) positions.

13. The fuel dispenser assembly of claim 9 wherein
2 said hose defines said first, fuel conduit for delivery of
3 fuel from said dispenser unit to said nozzle and further
4 defines a second, vapor conduit for vacuum flow of vapor
5 displaced from the vehicle tank, and
6 said first body portion and said second body portion
7 together define a vapor conduit connecting said vapor
8 conduit of said first hose segment with said vapor conduit
9 of said second hose segment for vacuum flow of vapor through
10 said breakaway assembly,
11 said breakaway assembly further comprising:
12 a vapor valve and a vapor valve seat, said
13 vapor valve mounted in said first body portion for movement

14 between a first position, with said vapor valve spaced from
15 engagement with said vapor valve seat for permitting vacuum
16 flow of vapor within said vapor conduit within said first
17 body portion, and a second position, with said vapor valve
18 in engagement with said vapor valve seat for restricting
19 vacuum flow through said vapor conduit within said first
20 body portion,

21 a vapor valve spring urging said vapor valve toward
22 said second position and, in said first condition of said
23 breakaway assembly, said vapor valve being urged toward said
24 first position,

25 whereby, during normal operation, the vapor valve is
26 urged toward its first (open) position, and, upon
27 application to the hose of tension above a predetermined
28 maximum level, the securement element releases, allowing the
29 first and second body portions to separate, and allowing the
30 vapor valve to move toward its second (closed) position to
31 cease vacuum flow through the first body portion.

1 14. The fuel dispenser assembly of claim 13 wherein
2 said hose is coaxial, and said first conduit for delivery of
3 fuel is a first, outer conduit and said second conduit for
4 vacuum flow of vapor displaced from the vehicle tank is a
5 second, inner conduit.

9 1 15. The fuel dispenser assembly of claim 13 wherein
2 said vapor valve is mounted for axial movement.

1 16. The fuel dispenser assembly of claim 15
2 wherein, in said first condition, said vapor valve and said
3 second fuel valve are disposed in engagement in a manner to
4 mutually urge said vapor valve and second fuel valve toward
5 said respective first (open) positions.

Sub
C1

1 1. A breakaway assembly for use in combination with
2 a fuel dispenser apparatus comprising a fuel dispenser unit,
3 a hose connected thereto, and terminating in a fuel delivery
4 nozzle, the hose defining at least a first, fuel conduit for
5 delivery of fuel from the dispenser unit to the nozzle, for
6 filling a vehicle tank, said breakaway assembly disposed
7 between a first segment of the hose attached to the
8 dispenser unit and a second segment of the hose terminating
9 in the nozzle,

10 said breakaway assembly comprising:

11 a first body portion adapted for attachment to
12 the first segment of the hose and a second body portion
13 adapted for attachment to the second segment of the hose,

14 said breakaway assembly having a first, assembled
15 condition in which said first body portion and said second
16 body portion are joined and together define a fuel conduit
17 connecting the fuel conduit of the first hose segment with
18 the fuel conduit of the second hose segment for flow of fuel
19 through the breakaway assembly, and said breakaway assembly
20 having a second condition in which said first body portion
21 and said second body portion are separated,

22 said breakaway assembly further comprising:

23 a first fuel valve and a first fuel valve seat,
24 said first fuel valve mounted in said first body portion for
25 movement between a first position, with said first fuel
26 valve spaced from engagement with said first fuel valve seat
27 for permitting flow of fuel within said fuel conduit within
28 said first body portion, and a second position, with said
29 first fuel valve in engagement with said first fuel valve
30 seat for restricting flow of fuel through said fuel conduit
31 within said first body portion,

32 a second fuel valve and a second fuel valve
33 seat, said second fuel valve mounted in said second body

02

2 a fuel dispenser apparatus comprising a fuel
3 dispenser unit, a hose connected thereto, and terminating in
4 a fuel delivery nozzle, said hose defining at least a first,
5 fuel conduit for delivery of fuel from said dispenser unit
6 to said nozzle, for filling a vehicle tank, and
7 a breakaway assembly disposed between a first
8 segment of said hose attached to said dispenser unit and a
9 second segment of said hose terminating in said nozzle,
10 said breakaway assembly comprising:
11 a first body portion adapted for
12 attachment to said first segment of said hose and a second
13 body portion adapted for attachment to said second segment
14 of said hose,
15 said breakaway assembly having a first,
16 assembled condition in which said first body portion and
17 said second body portion are joined and together define a
18 fuel conduit connecting said fuel conduit of said first hose
19 segment with said fuel conduit of said second hose segment
20 for flow of fuel through said breakaway assembly, and said
21 breakaway assembly having a second condition in which said
22 first body portion and said second body portion are
23 separated,
24 said breakaway assembly further comprising:
25 a first fuel valve and a first fuel valve
26 seat, said first fuel valve mounted in said first body
27 portion for movement between a first position, with said
28 first fuel valve spaced from engagement with said first fuel
29 valve seat for permitting flow of fuel within said fuel
30 conduit within said first body portion, and a second
31 position, with said first fuel valve in engagement with said
32 first fuel valve seat for restricting flow of fuel through
33 said fuel conduit within said first body portion,

34 a second fuel valve and a second fuel
35 valve seat, said second fuel valve mounted in said second
36 body portion for movement between a first position, with
37 said second fuel valve spaced from engagement with said
38 second fuel valve seat for permitting flow of fuel within
39 said fuel conduit within said second body portion, and a
40 second position, with said second fuel valve in engagement
41 with said second fuel valve seat for restricting flow of
42 fuel through said fuel conduit within said second body
43 portion,

44 a securement element securing together said
45 first body portion and said second body portion in said
46 first condition, said securement element adapted to release
47 engagement of said first body portion and said second body
48 portion upon application of tension force to said hose,
49 across said breakaway assembly, above a predetermined
50 maximum level,

51 a first spring urging said first fuel valve
52 toward said second position and a second spring urging said
53 second fuel valve toward said second position, and, in said
54 first condition of said breakaway assembly, said first fuel
55 valve and said second fuel valve being urged toward said
56 first positions,

57 whereby, during normal operation, the first and
58 second body portions are secured together by the securement
59 element, and the first and second fuel valves are urged
60 toward their first (open) positions, and, upon application
61 to the hose of tension above a predetermined maximum level,
62 the securement element releases, allowing the first and
63 second body portions to separate, and allowing the first and
64 second fuel valves to move toward their second (closed)
65 positions to cease flow of fuel from both body portions.